

Abstract

Improved timing synchronization and access control techniques for use in an orthogonal frequency division multiplexed (OFDM) wireless system or other type of wireless communication system. In accordance with the invention, an uplink synchronization and access control system is provided in which mobile stations transmit certain timing and access signals in dedicated intervals in an uplink stream. Access control is illustratively implemented as a two-stage process in which a given mobile first transmits a generic uplink access signal in one of the intervals. If this access is accepted, the base station transmits an access acknowledgment containing initial timing and power corrections, along with initial channel assignments on which the mobile can initiate a call set-up process. For re-synchronization, mobiles transmit timing synchronization signals in the dedicated timing and access intervals. The base station measures the arrival time of the signals, and sends back appropriate timing corrections. The invention thereby ensures that orthogonality between mobiles is maintained.